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ON THE QUESTION WHETHER " NEOTYPES " SHOULD BE RECOGNISED IN THE " RÈGLES " AS A CATEGORY OF TYPE SPECIMEN: AN APPEAL TO ZOOLOGISTS FOR ADVICE

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(**Commission's reference Z.N.(S.)358**)

(For the decision by the Thirteenth International Congress of Zoology
that an investigation should be made in regard to this subject, see 1950,
Bull. zool. Nomencl. **4**: 192-193)

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General considerations

1. Introductory : The present paper is concerned with the question whether "neotypes" should be recognised in the *Règles* as a category of type specimen and, if so, under what conditions and subject to what safeguards. The present is the sixth of the seven problems relating to the *Règles* which the Thirteenth International Congress of Zoology at its meeting held in Paris in 1948 considered in a preliminary fashion but on which it took no definite decisions, taking the view that the problem required further and more detailed consideration before decisions were taken thereon. The Congress accordingly invited me, as Secretary to the International Commission on Zoological Nomenclature, to confer on this subject with interested specialists with a view to the preparation of a comprehensive Report, with recommendations, for submission to the Fourteenth International Congress of Zoology when it meets in Copenhagen in 1953.

2. In the interval which has elapsed since the Paris Congress, I have taken every opportunity that has offered to obtain the views of interested specialists on this subject. This has led me to two conclusions: first, that the lack of type material may in certain circumstances offer an insuperable obstacle to the attainment of stability in nomenclature at the species-name level and therefore that there is a need for the insertion in the *Règles* of a provision which will enable a definite meaning to be attached to a given trivial name and thus put a stop to the endless discussion and pointless argument which has in many cases been going on for years, the continuation of which would otherwise be inevitable; second, that for the foregoing purpose so many workers over so wide an area of the Animal Kingdom have already attempted to meet the foregoing difficulty by the erection of unofficial "neotypes" that there is already a strong presumption that the official recognition of the "neotype" concept would be in accordance with the wishes of large numbers of zoologists. The opposition which has hitherto been evinced towards "neotypes" seems, on the other hand, to spring not so much from hostility towards "neotypes" as such as from opposition to the private and unofficial creation of "neotypes" and to fears that, if the "neotype" concept were to be officially recognised, the provisions relating to this class of type specimen might not be hedged in with sufficient safeguards to prevent this innovation from being seriously abused. In the present survey of the problem, I have attempted to set out as fairly as possible the disadvantages as well as the advantages involved in the recognition of "neotypes." Believing, as I do, that the general wish of zoologists will be that the Congress should recognise the "neotype" concept, I have however devoted a considerable amount of time to an examination of the practical problems which would have to be solved if any system of "neotypes" were to be made workable. Under each of the headings involved, I have also drawn up tentative suggestions to form the basis of discussion, if the Copenhagen Congress were to decide to pursue this subject.

3. As in the case of the problems dealt with in the earlier papers constituting the present series, I hope very much that Nomenclature Committees of Museums

and other scientific institutions will be good enough to furnish statements of the views of their members both on the general question whether it is desirable that "neotypes" should be recognised in the *Règles* and, if they are in favour of such action, on the suggestions put forward in the present paper on each of the problems upon which decisions would need to be taken by the Congress. Corresponding statements from individual specialists, particularly those who have themselves had occasion to consider the practical application of the neotype principle, are also very much desired.

4. It is particularly necessary in a case such as the present, where the suggestion is that provisions should be inserted in the *Règles* on some aspect of nomenclature which has not yet been made subject to international regulation that the data assembled for consideration by the International Congress of Zoology should be as comprehensive as possible and should be made available as long in advance of the Congress as may be found to be practicable. It is my hope therefore that it will be possible to publish in the *Bulletin of Zoological Nomenclature* the Report which I have been charged to prepare as far ahead as possible of the Copenhagen Congress. Specialist Committees and individual specialists who are interested in the present problem and who desire to express their views during the preliminary discussion of the issues involved will therefore be rendering a doubly valuable service if they will despatch the statements setting out their views in time for those statements to reach the Secretariat of the Commission not later than 31st July, 1952.

5. For the reasons explained in the preliminary note to the present series of papers (1952, *Bull. zool. Nomencl.* **7** : 1-3), the work of the Secretariat will be greatly assisted if communications on the present subject are typewritten on one side of the paper only, double-spaced, with wide margins, and furnished in duplicate. The names of signatories should be typewritten as well as written.

6. All communications sent in response to the present appeal for advice should be clearly marked with the Commission's Reference Number Z.N.(S.)358, and should be addressed to myself, as Secretary to the Commission (address : 28, Park Village East, Regent's Park, London, N.W.1, England).

(a) Problems calling for consideration in connection with the suggested recognition of "neotypes"

7. **Need for adequate safeguards against abuse if neotypes are to be recognised in the "Règles"** : When in 1945 the proposal that neotypes should be recognised in the *Règles* was first formally placed before the International Commission and the zoological public generally by the publication of an application on this subject received from Dr. Don L. Frizzell and Dr. Harry E. Wheeler (Stanford University, California, U.S.A.) (*Bull. zool. Nomencl.* **1** : 106-108), I published a short note (Hemming, 1945, *ibid.* **1** : 109-111), drawing attention to certain of the practical problems which would need to be solved and stressing the need for the adoption of rigorous safeguards to prevent the neotype system, if adopted, from being exploited for commercial

reasons or otherwise abused. Every specialist who has since written to me on this subject or with whom I have discussed it has agreed that, if neotypes are to be recognised, the most stringent provisions will be needed to forestall abuse of the foregoing kind. It seems to be generally agreed that the first of the provisions to be inserted in the *Règles* if neotypes are to be granted official recognition should stipulate that no specimen is eligible for selection as a neotype unless it is the property of a museum or other public institution or, on being so selected, is presented to, or placed on permanent loan in, such an institution.

8. Code of Ethics in relation to the designation of neotypes: The exploitation of neotypes for purposes of financial gain is not however the only form of abuse against which it is necessary to guard; for, if workers in any museum or other public institution were to be free to designate neotypes to an unlimited extent, there would—human nature and institutional pride being what they are—be a serious risk that some institutions might designate neotypes for species of which that institution had never possessed any of the original type material and in conditions where some other institution had a much stronger claim to be the possessor of neotypes, if these were to be established. For example, where, either through air-attack in time of war or through some natural calamity, such as fire or earthquake, type specimens possessed by a particular institution were destroyed, that institution clearly has a much stronger moral claim to be the possessor of any neotypes subsequently established than has any other institution, and it would be an abuse of the system of neotypes if any other institution were to be free to designate neotypes for the species concerned from among specimens in its own collection. On the other hand, it would be quite impracticable for a variety of reasons to include in the *Règles* a provision that neotypes are only to be designated from among specimens possessed by the institution in which the original type material had formerly been deposited; for (1) the missing type material of many species is not known ever to have been in a museum at all; (2) material suitable for designation as neotypes may not be possessed by the museum concerned or other material more suitable for this purpose may be in the possession of some other museum. While everyone will agree that, when a neotype is designated, due account should be paid to moral claims which any institution may have to be the one in which that neotype should be deposited, it is quite evident that this end cannot be secured by any specific provision to be inserted in the *Règles*; it is equally evident that the insertion in the *Règles* of a mere *Recommandation* such as the Code of Ethics (in regard to the giving of substitute names to species possessing invalid names) would not provide a safeguard of adequate strength. We are thus forced to the conclusion that the only way of ensuring against serious abuse of the neotype system would be the institution of some central authority, without the approval of which no neotype could be validly established.

9. Need for the avoidance of duplicate neotypes: It cannot be doubted that, if any worker were to be free to designate neotypes from among the specimens contained in the collection of any museum or similar institution, duplicate neotypes would constantly be created, just as today species already possessing valid names are constantly being re-described as new species. The

existence of duplicate or competing neotypes could not fail to lead to serious confusion, and would moreover bring discredit upon the whole neotype system. It is clearly essential therefore that adequate steps should be taken to guard against this danger. It is immediately evident that this object can be secured only by an arrangement under which no neotype designation could be validly effected unless that designation were registered with some central authority which alone would be in a position to ensure that no such designation was permitted if a neotype had already been designated for the species in question.

10. Need for the safe preservation of neotypes and the provision to specialists of reasonable access for the study of neotypes: We have seen that, in order to ensure against the risk of the commercial exploitation of neotypes, it must be an essential feature of any scheme for the official recognition of this category of type specimen that no specimen shall be recognised as a neotype unless it is in the possession of, or in the permanent custody of, some museum or other public institution. Such a provision should be sufficient for the particular purpose noted above, but, unless supplemented in two directions, it would not necessarily provide the guarantees necessary for the due preservation of neotypes or for the free study of neotypes by interested specialists. It is common knowledge not requiring any elaboration that not all museums and other public institutions possessing zoological and palaeontological collections exercise at all times a sufficiently high degree of care of the specimens entrusted to their charge to ensure the preservation of those specimens from risk of deterioration, destruction or loss. Clearly, if a new category of type specimen (neotypes) is now to be recognised, it is important that all practicable steps should be taken to ensure that type specimens of this category shall be deposited only in institutions which can be relied upon to take adequate care of them. Further, as is well known, the ability and willingness of institutions to provide facilities for the study of their collections by outside specialists varies very greatly. Here again, there will be general agreement that, if the establishment of neotypes is to be permitted, that permission should be limited to specimens belonging to, or deposited in, institutions which can be relied upon to permit reasonable access to those neotypes for study by interested specialists. Neither of the foregoing *desiderata*—as is evident—can be obtained by means of an express provision in the *Règles*, for clearly no institution can be expected voluntarily to refuse to accept neotypes for its collections on the ground that it is not competent either properly to look after those specimens or to provide adequate opportunities for their study. These objects can, in fact, only be secured by entrusting to some central body the duty of approving proposals for the establishment of neotypes, for such a provision would, *inter alia*, provide that central authority with a discretion in relation to all aspects of proposals so submitted.

11. Need for the publication of full descriptions and figures of specimens proposed to be designated as neotypes: Since the sole object of establishing neotypes and the only utility of neotypes when established is to provide the clearest possible standard of reference for the identification of the species in question, it is essential that any scheme for the recognition of neotypes should provide that, as an indispensable preliminary to the designation of a

specimen to be a neotype, there shall be published a full description and figure (or figures) of the specimen proposed to be so designated. Here again, if a uniformly high standard is to be assured, there will be a need for some central authority charged with the duty of ensuring that this requirement is fulfilled.

12. Circumstances in which the designation of a neotype should be permitted: In the discussions which have taken place on the question of establishing neotypes, it has generally been assumed that the purpose of this category of type specimen should be to provide a standard of reference in cases where the whole of the original type material on which a given species was described has been either lost or destroyed. This is undoubtedly the principal class of case for which neotypes are required. It is not however the only class of case, for it sometimes happens that the need for an adequate reference specimen is just as great where some of the original type material still survives as it is when the whole of that material has disappeared. Naturally this situation is not confined to cases where syntypes only are available but may arise also where the lectotype or even the holotype of the species is still in existence. This kind of situation may be illustrated by the following examples: (a) In the case of many Recent species positive identification is dependent upon the examination of some particular structure, and it may easily happen that the holotype or surviving syntypes (where no holotype was designated by the original author) are so broken or otherwise in such bad condition as to be useless for the purpose of providing a standard for identification; (b) In the case of Fossil species the surviving type material may also be too fragmentary to afford a satisfactory basis for the revision of the species concerned; in addition, such type material may consist of casts only, entirely lacking the essential internal structure. In cases of this kind, it is clearly just as necessary that a neotype should be provided as it is in cases where the whole of the original type material has disappeared.

13. Importance of ensuring that a specimen designated to be a neotype should conform as closely as possible with the original description of the species concerned: In designating a specimen to be a neotype, it is clearly desirable that normally the specimen should conform as closely as possible with the original description of the species concerned and with any figure which may have been published with the original description. For example, if it is clear from the original description that the description was based exclusively upon a specimen (or specimens) of one sex only, the specimen to be designated as the neotype should be of that sex, except where the characters diagnostic for the species are much more clearly marked in the other sex. Similarly, where a species has more than one annual generation, the successive generations differing from one another, the specimen to be designated as the neotype should be of the annual generation described or depicted in the original description of the species. A similar principle should, it will be agreed, be observed, where the species was originally described from a specimen belonging to one of two or more dimorphic forms. It may however happen occasionally that a species for which it is desired to establish a neotype was based by its original author upon some aberrant individual form; in such a case, it may be thought desirable to designate as the neotype a more representative example.

The conclusion which appears to emerge from the foregoing considerations is that, although in general it is desirable that a specimen designated to be a neotype should possess as many as possible of the known characteristics of the specimen (or specimens) upon which the species in question was originally based, there may be circumstances in which a departure from this principle in one or more respects would be desirable. Accordingly, it seems that this is not a matter on which mandatory provisions should be included in the *Règles*; it would however be desirable to include a *Recommandation* on this subject, in order to indicate to workers contemplating the designation of a neotype the principles which it is desirable should be followed, so far as individual circumstances permit.

14. Question whether a specimen designated to be a neotype should be from the same locality as that from which the species concerned was originally described: In accordance with the general principle that a specimen selected as a neotype should resemble the specimen from which the species was originally described as closely as may be found to be practicable, it is clearly desirable that, other things being equal, a neotype should be a topotypical specimen. For a variety of reasons however this may not always be practicable. The following examples illustrate circumstances, entirely different in character, in each of which however it would be impossible to give effect to the foregoing principle: (a) In some cases a Recent species was originally described from an extremely limited locality and has since become extinct in that locality as the result of human agency (e.g. building development, drainage schemes, etc.) or natural causes (such as flooding, erosion, volcanic action or the like); in such cases it would be impossible to obtain fresh material from the type locality, and the choice would rest between designating as the neotype some old—and possibly unsatisfactory—specimen labelled as having been taken in the type locality or entirely satisfactory newly taken material from some other locality. (b) In the case of Fossil species, it might be impossible to obtain topotypical material, not because the site had been destroyed but because the condition of the rocks from which the type material had originally been obtained was such that no specimens were obtainable in a sufficiently good state of preservation to permit of the study of internal structure, an essential condition to the designation of a neotype. In such cases the insistence upon a rule that a neotype must be a specimen from the same locality as the original type material of the species concerned would mean that for the particular species concerned it might be impossible to find a specimen which was both in good condition and was also eligible for selection as a neotype. Such a rule would therefore clearly stultify the purpose for which it is proposed that official recognition should be given to neotypes. Accordingly, it seems to me that, while it is desirable that a specimen designated to be a neotype should, wherever possible, be one collected from the same locality, or, in the case of a parasitic species from the same host species, or, in the case of a fossil species, both from the same locality and in rocks of the same geological age and in the same horizon, i.e. at the same depth above or below some recognised zone, as the specimens upon which the species was originally founded, it would not be desirable to make this a universally binding mandatory provision. It is suggested therefore that this is a matter which could only be appropriately

dealt with in the *Règles* by means of a *Recommandation*. It will be appreciated that, if—as we have already seen appears necessary for quite other reasons—the scheme were to include a provision that no specimen was to be officially recognised as a neotype until it had been approved as such by some central body, it would be within the power of that central body to ensure that the principle set forth above was duly observed in every case where it was practicable to apply it. Where it is judged necessary to designate as a neotype a specimen not obtained from the original type locality, the locality from which the neotype was obtained would need to become the revised type locality of the species. We have to remember also in this connection that, although the concept of a “type locality” in the case of Recent species and, in the case of Fossil species, the above concept and also the concept of a “type horizon” are universally recognised by specialists, neither of those concepts finds at present any recognition in the *Règles*. There is thus at present no means for selecting a “lectotype locality” from a number of “syntype localities” or, in the case of a Fossil species of selecting a “lectotype horizon” from among two or more “syntype horizons” cited by the original author of a nominal species; nor are there any means at present (1) by which to restrict an unduly vague or imprecise “type locality” or “type horizon,” (2) for making any authoritative and binding correction of a “type locality” or “type horizon” when that cited by the original author of a nominal species is manifestly incorrect, nor (3) for supplying an authoritative “type locality” or “type horizon” for a nominal species, the original description of which did not contain these essential particulars. These omissions constitute a serious cause of confusion and must clearly be made good in any comprehensive plan for promoting uniformity and stability in nomenclature. Proposals for dealing with this matter are accordingly included in the discussion of this—the most important single problem now awaiting decision—given in the immediately following paper in the present series (pp. 172–180). The subject is referred to here because, as will be appreciated, the provision of a satisfactory method for determining and, where necessary, restricting “type localities” and “type horizons” is an indispensable prerequisite for the adoption of any scheme for the official recognition of neotypes.

15. Status of any surviving type material when a neotype has been established: In our consideration of the circumstances in which it should be permissible to establish a neotype (paragraph 12 above), we have seen that in certain conditions it may be just as important to establish a neotype for a species, of which some of the syntypes or even the lectotype or holotype are extant, as it is in the case of a species, the whole of the original type material of which has been lost or destroyed. Accordingly, it would certainly be necessary that the scheme to be included in the *Règles* should provide that, on being officially established, a neotype is to take precedence over any such surviving type material. There is a further aspect of this question which will require to be considered: this is the situation which from the point of view of nomenclature would arise if, after a neotype had been duly established for some species of which either (1) all the original type material had disappeared or (2) the surviving type material was in such bad condition as to be insufficient to provide a firm basis for the identification of the species in question, the

original type material, in the first case, or additional syntypes, in the second case, were to be found. If such a discovery were to be made, it might be found—and it is to be hoped that in most instances it would be found—that the neotype and the rediscovered type material were referable to the same species; it might occasionally happen, however (particularly, perhaps, in the case of Fossil species) that the neotype belonged to a different species from that to which the original type material was referable. In either case a problem of nomenclature would arise, for which it is desirable that provision should be made in any scheme authorising the establishment of neotypes. It would clearly be most undesirable that on the rediscovery of type material previously supposed to have been lost a neotype established for the species in question should automatically be deprived of its status as the unique specimen which alone constitutes the ultimate standard of reference for the determination of the identity of the species in question. Some provision to ward against this danger should therefore certainly be included in any scheme authorising the establishment of neotypes. There are two possible ways by which this end could be achieved: (a) It would be possible to provide in the *Règles* that, on the establishment of a neotype, all surviving type material, whether at that time known to be in existence (this being a provision which, as already shown, will in any case be necessary for other reasons) or discovered subsequent to the establishment of a neotype for the species in question, should be deprived of its status as such. (b) Without going so far as (a) above, it would be possible to include in the *Règles* a provision that, in the circumstances assumed, a neotype is to retain its status as such unless and until, on the facts being laid before it, the International Commission on Zoological Nomenclature were otherwise to direct. It is suggested that of these alternatives, (a) is preferable to (b), since it recognises more fully the essential consideration that the sole purpose of authorising the establishment of neotypes is to provide a final and irrevocable standard for the identification of a species in cases where there is no surviving type material or where the known surviving type material is insufficient for this purpose.

16. Need for publicity and for consultation between specialists prior to the establishment of a neotype: The official recognition of a specimen as a neotype amounts in effect to the provision of an entirely new basis for the identification of the species concerned, while retaining for that species its original name with its original author and priority. It is extremely important therefore that, before any specimen is officially recognised as a neotype, there should be the fullest consultation between interested specialists. For this purpose it is quite clear that any scheme for the recognition of neotypes must include mandatory provisions relating to the giving of public notice of every proposal for the establishment of a neotype. The notice so given should, it is suggested, be made in a form designed to serve a twofold purpose: (1) to draw attention to the proposal that a neotype should be established for the species concerned; (2) to provide an opportunity to institutions or individuals possessing, or believing themselves to possess, type material of the species concerned previously believed to have been lost to bring forward evidence on this subject for consideration before a decision is taken to establish a neotype. It is suggested further that the period of public notice should

not be deemed to start (1) until the application for the establishment of the neotype concerned has been published in the *Bulletin of Zoological Nomenclature* and (2) until after the publication of a paper containing a full description and figures of the specimen proposed to be designated as the neotype, in those cases where detailed particulars on this subject are not included in the application referred to in (1) above.

17. Length of the period of public notice desirable before a proposal for the establishment of a neotype is approved: The subject matter on which consultation is needed before a neotype is established is necessarily more complex than that involved in a proposal that the Commission should use its plenary powers for the purpose (say) of validating some well-known name in current use; for in the former case it is necessary for specialists to consider not only whether the establishment of a neotype is desirable, but also whether the specimen proposed to be so designated is in every respect the most suitable for the purpose; in addition, it is very desirable that full opportunity should be given for the bringing forward, for consideration, of alleged type material of the species, the existence of which was not known to the specialist by whom the proposal for the establishment of a neotype is submitted. In the case of applications involving the use of the plenary powers the issue involved is both much narrower and much simpler in character; the problem involved is in most cases extremely well known to the specialists concerned and the only question at issue is whether or not it is desirable in the interests of nomenclatorial stability that the plenary powers should be used. It is suggested, therefore, that in these circumstances consideration should be given to the question whether the period of prescribed public notice should not be longer in the case of proposals for the establishment of neotypes than for proposals involving the possible use of the plenary powers. The period of notice in plenary powers cases is now one of six calendar months from the date of the publication of the application in question in the *Bulletin of Zoological Nomenclature*, having been reduced from twelve months by the last International Congress of Zoology (Paris, 1948). The only purpose of recognising neotypes as a category of type specimen, if such is decided upon, will be to provide means for meeting a practical need; from this point of view it would clearly be wrong to impose an unnecessarily long period of notice before decisions could be taken in such cases, for the imposition of such a restriction would deprive the new provisions of much of their practical utility. On the other hand, in a matter of this kind it is extremely important that an adequate period should be provided for bringing such proposals to the attention of interested specialists and for enabling such specialists to make known their views on the complex problems involved. It is difficult to strike a satisfactory balance between these opposing desiderata. On the whole, my feeling is—and I put forward this suggestion for consideration—that it would be wise at least in the initial period to fix the prescribed period of notice in neotype cases at twelve months.

18. Neotypes and the "Official List of Specific Trivial Names in Zoology": Clearly no decision more vital to the interpretation of a specific name could be taken than one establishing a neotype for the species so named.

It will be evident therefore that it would be essential in any circumstances that the trivial name of every nominal species for which a neotype is established should be entered upon the foregoing *Official List* with a note regarding the neotype established, even if the Commission were not already under instructions from the International Congress of Zoology to enter upon it every valid trivial name in respect of which a decision is taken by it. In every case the entry on the *Official List* should include particulars of the locality in which the neotype was obtained and of corresponding additional data in the case of Fossil species and parasitic species (see paragraph 14 above).

19. Relation of neotypes to restricted identifications previously effected : It would be important to ensure that, if neotypes are recognised, provision should be made to secure that the selection of a specimen to be a neotype does not run counter to any restrictions or restricted identifications previously effected. First, where a nominal species was originally published as a composite species but was restricted to a single species by the mechanism provided by Article 31, it would be essential that the specimen selected as the neotype should belong to the species to which the name of the originally composite species had thus been restricted. Similarly, where a nominal species, though not at the species level a composite species, was nevertheless originally based upon examples of two or more subspecies of the same species and the subspecies to which the trivial name should adhere had later been determined under the provisions of the foregoing Article, it would be essential to secure that the designation of a neotype is made in such a way as to avoid any change in the subspecies to be regarded as nominotypical. Again, in many cases an author, acting as a reviser, has defined the content of some nominal species by identifying the taxonomic species represented by that nominal species with the species represented by some later and more detailed description or figure ; in consequence that later description or figure has come to be accepted as the standard to be used for reference purposes in the identification of the species concerned. If in such a case it were to be desired to designate a neotype, it would be important that the neotype designation so made was consistent with the standard previously established in the foregoing manner. If it were decided to provide means in the *Règles* for the establishment of neotypes, that procedure would afford an absolutely firm basis for the identification of whatever might be the species in question. There would therefore no longer be any need for the powers conferred upon the Commission by the Thirteenth International Congress of Zoology, under which the Commission was given the power to determine the species to which any trivial name should apply (1950, *Bull. zool. Nomencl.* **4** : 324), for those powers were designed to secure exactly the same end as that which neotypes would serve. In such circumstances the foregoing powers should certainly be revoked, for it would be most undesirable that the *Règles* should contain more than one set of provisions relating to any one subject. Finally, the revocation of the foregoing powers should be accompanied by a provision confirming the small number of decisions already taken by the Commission under those powers. Some of those decisions related a particular trivial name to a figure and not to a specimen and it would probably be found desirable that the confirming provision should include some means for the substitution, as the basis of the identification, of a neotype for the figure cited

in the decision already taken by the Commission. In one case (*Papilio plexippus* Linnaeus, 1758), the figure selected by the Commission to serve as the basis for the identification of a species has since been found unsatisfactory at the subspecies level (1950, *Bull. zool. Nomencl.* 4 : 361) and the defect so disclosed should be remedied by the substitution of a neotype for the figure already designated by the Commission, the specimen so designated to belong not only to the species in question but also to the subspecies commonly accepted as being the nominotypical subspecies of that species.

20. Proposed grant to the International Commission on Zoological Nomenclature of the exclusive right to designate neotypes : We have seen that in a number of essential respects the intervention of some central body would form an essential feature of any scheme for the grant of official status to individual neotype specimens, e.g. (1) on the question of the appropriateness of a given institution, as contrasted with other institutions, to be the institution in which a specimen proposed to be designated as a neotype should be deposited (paragraph 8), (2) for the purpose of ensuring against the risk of the establishment of duplicate neotypes (paragraph 9), (3) for the purpose of deciding whether the institution to which a specimen proposed to be designated as a neotype belongs or in which it is proposed to place such a specimen on permanent loan is one where there is a reasonable prospect that proper steps will be taken to preserve the specimen proposed to be selected as a neotype and to provide interested students with access to that specimen for the purpose of study (paragraph 10), (4) for the purpose of ensuring, in consultation with specialists in the group concerned, that the description and figures of the specimen proposed to be designated as the neotype of any given species that have been published in connection with or, prior to, the proposed designation of that specimen as the neotype of the species come up to the requisite standard of accuracy and completeness (paragraph 11), (5) for the purpose of ensuring that the specimen proposed to be designated as the neotype of a species should conform as closely as possible with the original description of the species (paragraph 13), (6) for deciding whether the proposed neotype should be a topotypical example (paragraph 14). These are functions which only the International Commission on Zoological Nomenclature is in a position to discharge. It is accordingly suggested that if the neotype concept is to be recognised in the *Règles*, the power to designate specimens to be neotypes should be vested exclusively in the International Commission and that the grant of this right should be accompanied by a provision making it the duty of the Commission, when designating specimens as neotypes, to pay regard, *inter alia*, to the six considerations specified in the earlier part of the present paragraph. The scheme should include a provision that, as an essential part of the designation of a specimen to be a neotype (or of the giving of legal force to an unofficial neotype established prior to the introduction of the scheme) the trivial name of any species for which a neotype is designated should be registered on the *Official List of Specific Trivial Names in Zoology*, the entry so made to include a reference to the specimen so designated as neotype, together with the particulars relating thereto, paragraph 18 above.

21. Procedure proposed to be adopted by the International Commission when considering an application for the designation of a neotype ;

The decision involved when the Commission grants an application for the designation of a neotype for a given species will be one which not only calls for a high sense of responsibility but will also demand exceptional care and will require the fullest preliminary consultation with interested specialists in the group concerned. For these reasons it is suggested that the scheme conferring upon the Commission the power to designate neotypes should be made subject to certain exceptional procedures not required in applications relating to other problems of nomenclature. The special procedures which it is suggested should be prescribed in the scheme are discussed in the two immediately following paragraphs.

22. Proposed grant to the International Commission of power to prescribe rules regarding the information to be furnished in any application for the designation of a neotype : Experience shows that very few applications contain the whole of the requisite information at the time when they are first submitted to the Commission ; it is for this reason that, even if the Commission possessed (as it does not) the staff and funds to enable it to deal as rapidly as possible with all applications submitted to it, the consideration of many applications would be delayed by reason of the need for obtaining essential particulars omitted from those applications when first submitted. The amount of detailed information required in a normal application is considerably less than would be needed in an application for the designation of a neotype, and it must certainly be expected that at least in the initial stages after the introduction of the scheme a high proportion of the applications received would be incomplete in a greater or less degree. In these circumstances it would be helpful to applicants, would save time and would relieve the Commission of unnecessary expense if the Commission were to be empowered to prescribe, by order, the information to be furnished in applications relating to the designation of neotypes and similar matters, and it is suggested that provision for this should be made in the scheme.

23. Need for a high degree of participation by interested specialists in applications for the designation of neotypes of species belonging to their respective groups : The purpose of creating neotypes is to facilitate the conduct of taxonomic work by removing doubts as to the identity of the species to which given trivial names are applicable. In these circumstances it will be generally agreed that it is very important to secure that, if the neotype concept is to be recognised in the *Règles*, the procedure to be devised for regulating the designation of individual neotypes should be such as to ensure a high degree of participation by interested specialists in the discussions leading up to decisions on such matters and a predominant influence by such specialists upon the nature of such decisions. To secure the first of these desiderata, I have suggested (a) that the scheme should impose an obligation upon the Commission to give public notice of the receipt of applications for the designation of a neotype in the same way that such notice is required in the case of applications involving the possible use of the plenary powers (paragraph 16) and (b) that, in view both of the complexity of the issues involved in such applications and the need for ensuring that decisions thereon should be as complete as possible and should be as technically satisfactory as care, con-

sultation and study can make them, the period of notice in relation to applications belonging to this class of case should be extended from one of six months to one of twelve months (paragraph 17). The second of the foregoing desiderata should, I suggest, be attained by the form of wording to be used in the *Règles* defining the duties of the Commission when considering applications for the designation of neotypes. What I have in mind—and what I now put forward for consideration—is that the wording to be used should be such as to make it clear that the function of the Commission in relation to an application for the designation of a neotype shall be substantially confined (1) to its satisfying itself that the general principles laid down in relation to the designation of neotypes (i.e. those summarised in paragraph 20 above) have been complied with in the application (2) to its taking the prescribed steps to obtain the views of interested specialists in regard to the application, and (3), on having satisfied itself in regard to the matters specified in (1) above and having taken the action specified in (2) above, to giving the stamp of official approval to the proposal submitted by designating the neotype recommended and by placing the trivial name of the species concerned on the *Official List of Specific Trivial Names in Zoology* with an appropriate reference to the designation of a neotype so made, together with the supplementary particulars specified in paragraph 18 above. A procedure of the foregoing kind would, it is believed, provide all the safeguards required. In addition, it would in effect make the Commission in this matter little more than the agent for giving effect to the wishes of specialists in particular groups, so far as concerns the designation of neotypes for species belonging to those groups. It cannot however be hoped that in every case there will be unanimity among workers on applications for the designation of neotypes for species belonging to the groups in which those workers are specialists. To meet this contingency, the scheme will need to include a provision empowering the Commission, in cases where opinion among interested specialists is divided, to take whatever decision may appear to it, in the light of the information given in the application and elicited in the subsequent prescribed consultations, to be best calculated to promote uniformity and stability in the specific nomenclature of the group concerned.

24. Unofficial "neotypes" established by individual specialists prior to the recognition in the "Règles" of this category of type specimen: That a decision on the question of the conditions in which neotypes can legitimately be established is already overdue is shown by the fact that already many specialists (both neontologists and palaeontologists) working in various groups of the Animal Kingdom have published papers in which they have specified individual specimens as "neotypes" of the species on which they were working. The specimens so specified have no doubt been labelled as "neotypes" in the collections in which they are deposited. The existence of these privately selected unofficial "neotypes" will no doubt be a cause of some embarrassment in the period immediately following the official recognition in the *Règles* of the concept of neotypes. No doubt in many cases the specimens unofficially selected as "neotypes" in this way satisfy all the requirements needed for the selection of a specimen for designation as an official neotype under the scheme now suggested; it may be expected therefore that many of these unofficial "neotypes" will be granted the status of an official neotype

after the new scheme has been introduced. In any case account should be taken of such unofficial "neotypes" wherever one has been selected in respect of a species for which, after the introduction of the scheme, it is proposed that an official neotype should be established. It must be expected however that some at least of these unofficial "neotypes" will fail to secure the approval of interested specialists, while certainly in many cases unofficial "neotypes" have been established unnecessarily, such specimens amounting to little more than well-described topotypical specimens. It is clearly desirable that everything possible should be done to prevent confusion from arising between these unofficial "neotypes", which possess no status in nomenclature, and neotypes officially established under the *Règles* after the introduction of the new scheme. It is not easy however to suggest means for securing this object. One course would be to adopt in the *Règles* some new term to denote the concept at present denoted by the word "neotype", for this would at once draw a sharp distinction between specimens officially recognised under the *Règles* as belonging to this category and those specimens already unofficially styled as "neotypes". It seems likely however that the expression "neotype" has now become so well known and is so deeply embedded in the literature that the general feeling among specialists would be against dropping it in favour of some newly-coined expression; this is a question on which the views of specialists would be especially welcome. If it is felt that it would not be practicable to substitute some new expression for the expression "neotype", it would still be possible to distinguish officially recognised neotypes from unofficially established "neotypes", by assigning to the former a number in some specially established series, such as "ICZN/1", "ICZN/2", etc., these numbers being used in the entry regarding the name in question in the *Official List of Specific Trivial Names in Zoology* and being affixed also to the specimen concerned.

(b) Questions upon which the advice of specialists is now sought

25. The question whether the concept of a "neotype" as a category of type specimen is to be recognised in the *Règles* will, under the decision taken by the Thirteenth International Congress of Zoology, Paris, 1948, be brought forward at Copenhagen in 1953 for decision by the Fourteenth International Congress. The present question differs from most of the others to be considered by that Congress in two important respects: First, it is concerned with a problem on which no provisions of any kind exist at present in the *Règles* and is therefore one which, from the point of view of the *Règles*, breaks entirely new ground. Second, this is a question on which considerations of practical utility and the need for preventing defects in the *Règles* from acting as a break on zoological and palaeontological work have led many specialists in widely diverse fields of the Animal Kingdom to anticipate the reform of the *Règles* in this matter; for already many workers have accepted the principle of neotypes and large numbers of unofficial neotypes have in fact been designated and are commonly recognised. The first question which the Copenhagen Congress will need to decide is therefore whether the existing *de facto* acceptance of the neotype concept is to be regularised by *de jure* recognition in the *Règles*, or, alternatively, whether an attempt is to be made to set back the hands of the clock in this matter by a blunt refusal to accord any recognition to neotypes.

If the decision at Copenhagen is in favour of recognising the neotype concept, immediate consideration will then need to be given to the circumstances in which the designation of neotypes is to be permitted, the safeguards which it will be necessary to impose and the machinery to be adopted for ensuring that the new provisions are duly observed. These are all matters of great practical importance and in many cases the decisions to be taken will necessarily be interdependent if a coherent and workable plan is to be devised. It is for this reason that in the present paper I have devoted considerable attention to these questions and have suggested provisions which appear to be not only the most appropriate in each case but also the provisions best calculated to serve as parts of a single co-ordinated plan. As the next step, I am most anxious to obtain from as many specialists as possible their views both on the outline of a plan for the recognition of the neotype principle which I have drawn up in the present paper and on the individual provisions which I have suggested should be included in it. The questions on which the advice of specialists is now sought are therefore : (1) Are you in favour of the recognition in the *Règles* of the concept of neotypes as a category of type specimen? (2) If you are in favour of such recognition, what are your views on the draft plan now submitted for discussion and on each of its component parts? (3) Are there any questions that are not dealt with in the draft plan on which you consider that provisions should be inserted in the *Règles* if the neotype principle is to be adopted and, if so, what are these questions and how do you suggest that they should be dealt with in the *Règles*?